INFORMATION

from the Greater St. Louis Citizens' Committee for Nuclear Information
4484 West Pine Blvd. St. Louis 8, Missouri JE 3-0353 (9 a.m. to 12 noon)

December 24, 1958

BABY TOOTH SURVEY LAUNCHED IN SEARCH FOR DATA ON STRONTIUM 90

Plans to collect 50,000 baby teeth a year to provide an important record of the absorption of radioactive strontium 90 by children in the St. Louis area have been made by the Greater St. Louis Citizens' Committee for Nuclear Information.

Parents and children in the St. Louis area are being asked to participate in this project by mailing deciduous (baby) teeth to Baby Tooth Survey at the Committee's address, 4484 West Pine Boulevard, St. Louis 8, Missouri.

To provide data on the dietary source of tooth-building materials containing strontium 90, the teeth should be mailed in an envelope together with a slip of paper containing the following information:

Name of child:
Date of birth:
Birthplace:
Where mother lived during pregnancy: City: State:
Was the child breast fed? How long?
Was the child bottle fed? Type of milk used:
How long?
Year in which the tooth came out:
Name of Parent:
Address:

WHY BABY TEETH

Since the beginning of the atomic era, Atomic Energy Commission and United States Public Health Service laboratory analyses have shown a yearly increase in the amount of strontium 90 in soil and food. Public interest in the strontium 90 problem in the St. Louis area has been sparked by reports that among five areas tested, milk from the St. Louis milkshed contains the highest strontium 90 levels for 1958.

The value of collecting deciduous teeth for strontium 90 analysis was called to the attention of the Committee early last summer by Dr. Alfred S. Schwartz, St. Louis pediatrician and vice-president of the Committee.

Shortly thereafter an article appeared in the British scientific publication Nature (Vol. 182, p. 283, August 2, 1958) by Dr. Herman M. Kalckar, a prominent biochemist at Johns Hopkins University, calling for the establishment of a program of tooth collection for strontium 90 analysis throughout the world. In this article Dr. Kalckar states, "Such an International Milk Teeth Radiation Census would contribute important information concerning the amount and kind of radiation received by the most sensitive section of any population, namely, the children. At present important although rather erratic data exist, based on autopsy of bone samples derived mainly from adults."

In setting up the Baby Tooth Survey, the Committee for Nuclear Information, as far as it knows, is the first group to initiate a large scale collection of baby teeth.

COLLECTION MUST BEGIN AT ONCE

The importance of an immediate collection of deciduous, or baby, teeth lies in the fact that teeth now being shed by children represent an irreplaceable source of scientific information about the absorption of strontium 90 in the human body. Beginning about 10 years ago, strontium 90 from nuclear test fallout began to reach the earth and to contaminate human food.

Deciduous teeth now being shed were formed from the minerals present in food eaten by mothers and infants during the period 1948 to 1953 -- the first few years of the fallout era -- and therefore represent invaluable base-line information with which analyses of later teeth and bones can be compared. Unless a collection of deciduous teeth is started immediately, scientists will lose the chance to learn how much strontium 90 human beings absorbed during the first years of the atomic age.

Strontium 90 present in food accumulates in bones and teeth; milk is the main food source of strontium 90. In sufficient amounts the radiation from strontium 90 may cause harmful effects, including bone tumors and other forms of cancer. In the St. Louis area, the average strontium 90 value for milk in the past year is 12% of the level of radiation that is now considered safe. The strontium 90 level of milk, and of human bones and teeth formed from minerals contained in milk, will continue to increase for approximately 10 years, even if no further nuclear explosions occur, because the strontium 90 injected into the stratosphere by past nuclear tests continues to fall to the earth.

VALUE OF TOOTH ANALYSIS

To assess the possible strontium 90 hazard to the present generation of children -- the first to experience this danger--scientists need to follow the strontium 90 content of the human body from year to year. Bone samples are difficult to obtain and involve long delays, but it is hoped that analysis of teeth will prove to be a practical means of following the trend of human strontium 90 uptake. Baby teeth are most favorable because their mineral content is laid down during a short period just before and after birth, and because they are readily available.

Since strontium 90 analyses of human bones and teeth that have been completed to date show a wide range of variation, analyses of material obtained from relatively large numbers of people are necessary to assure that the results will be representative of the population at large. For this reason and because it is expected that a number of teeth will have to be pooled to provide enough material for a strontium 90 analysis, the Committee has set a goal of collecting 50,000 teeth per year from the children of the St. Louis area. Collection and analysis of this number of teeth over a ten year period will provide a picture of the absorption of strontium 90 by children in the St. Louis area during the period 1949 - 1959.

The tooth collection program has been organized by a CNI subcommittee under the leadership of Dr. Louise Reiss, physician, who has been named director of the project. Other members of the subcommittee are Dr. Barry Commoner, Professor of Plant Physiology at Washington University; Mrs. Leslie E. Heinz; Mrs. Joseph P. Logan; Dr. Eric Reiss, Assistant Professor of Preventive Medicine and Medicine at Washington University School of Medicine; and Dr. Alfred S. Schwartz, Assistant Professor of Clinical Pediatrics at Washington University School of Medicine.

SCHOOLS OF DENTISTRY OFFER ASSISTANCE

The scope and purpose of the Baby Tooth Survey was discussed with the deans of the Schools of Dentistry at St. Louis University and Washington University. Dean Leroy R. Boling of Washington University and Dean Stephen P. Forrest of St. Louis University expressed the belief that the project may be expected to produce valuable information and offered to support the study with technical and consultative assistance.

The teeth collected will be examined and classified by a committee of dentists headed by Dr. John T. Bird, Associate Professor of Dental Medicine and Assistant Dean of the Washington University School of Dentistry. Dr. Bird stated, "The project might well be an important source of information for the scientific analysis of strontium 90 absorption and deserves careful attention for this reason." This committee will classify the teeth according to mouth position, since the different teeth vary with respect to the time at which minerals are deposited in them.

After classification, the tooth collection and the background data on the tooth donors will be transmitted to a suitable laboratory for analysis for strontium 90.

The Committee for Nuclear Information will inform the St. Louis public about the results of these analyses as they become available. Since a number of teeth from different children must be pooled for each strontium 90 analysis, no individual reports of strontium 90 content of separate teeth can be made.

IMPORTANCE OF DIETARY INFORMATION

Various types of baby teeth originate at different times during pregnancy and the first year of the infant's life. From the chart which follows it can be seen, for example, that the mineral content of an incisor -- or front tooth -- is laid down from food minerals during the last 4-5 months of pregnancy and the following 3 months of the infant's life. Accordingly, when a baby incisor tooth is analyzed for strontium 90, the results reflect the strontium 90 content of the mother's food and of the food given to the infant in the first 3 months of life. If the child was breast fed, then all of the mineral content of this tooth will have come from the mother's food and bones, and the strontium 90 analysis will therefore reflect the radioactive level of the mother's diet during and after pregnancy. On the other hand, the deciduous second molars received their minerals during the last three months of pregnancy and for 10 to 11 months after the child was born. In this case the strontium 90 content of the tooth will give a picture in the main of strontium 90 levels in the food that the child was given during the first year of infancy.

For these reasons the collection of teeth for strontium 90 analysi must be accompanied by information about the type of feeding the child received during the first year of life. It is also necessary that the various types of teeth be analyzed separately, so that the results may be correlated with a specific calendar year and with the types of foods consumed by mother and child. From the chart shown here and the birth-date of the child whose tooth is contributed, a determination can be made of the calendar time during which the particular tooth received its mineral deposit from maternal or infant diets.

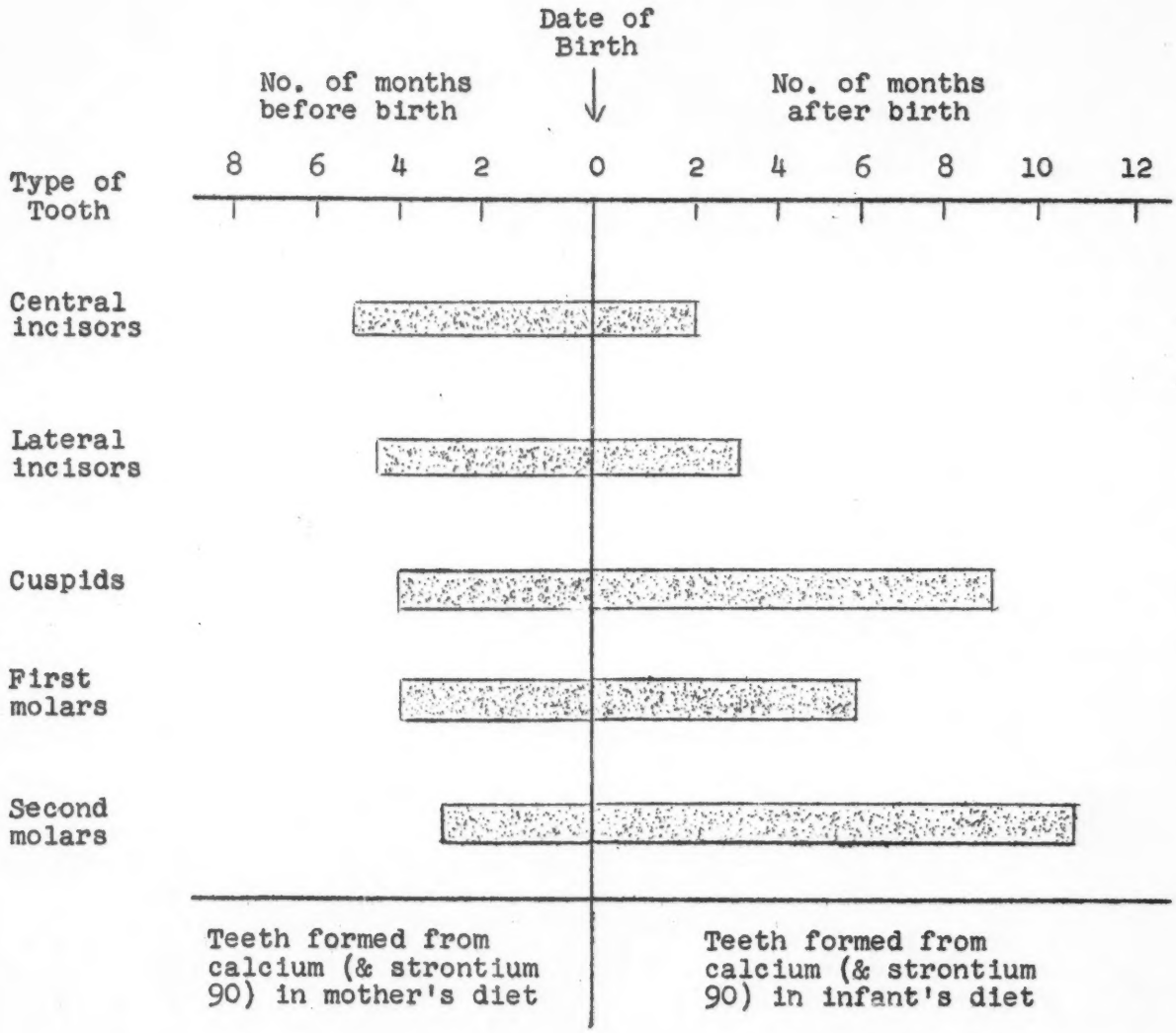
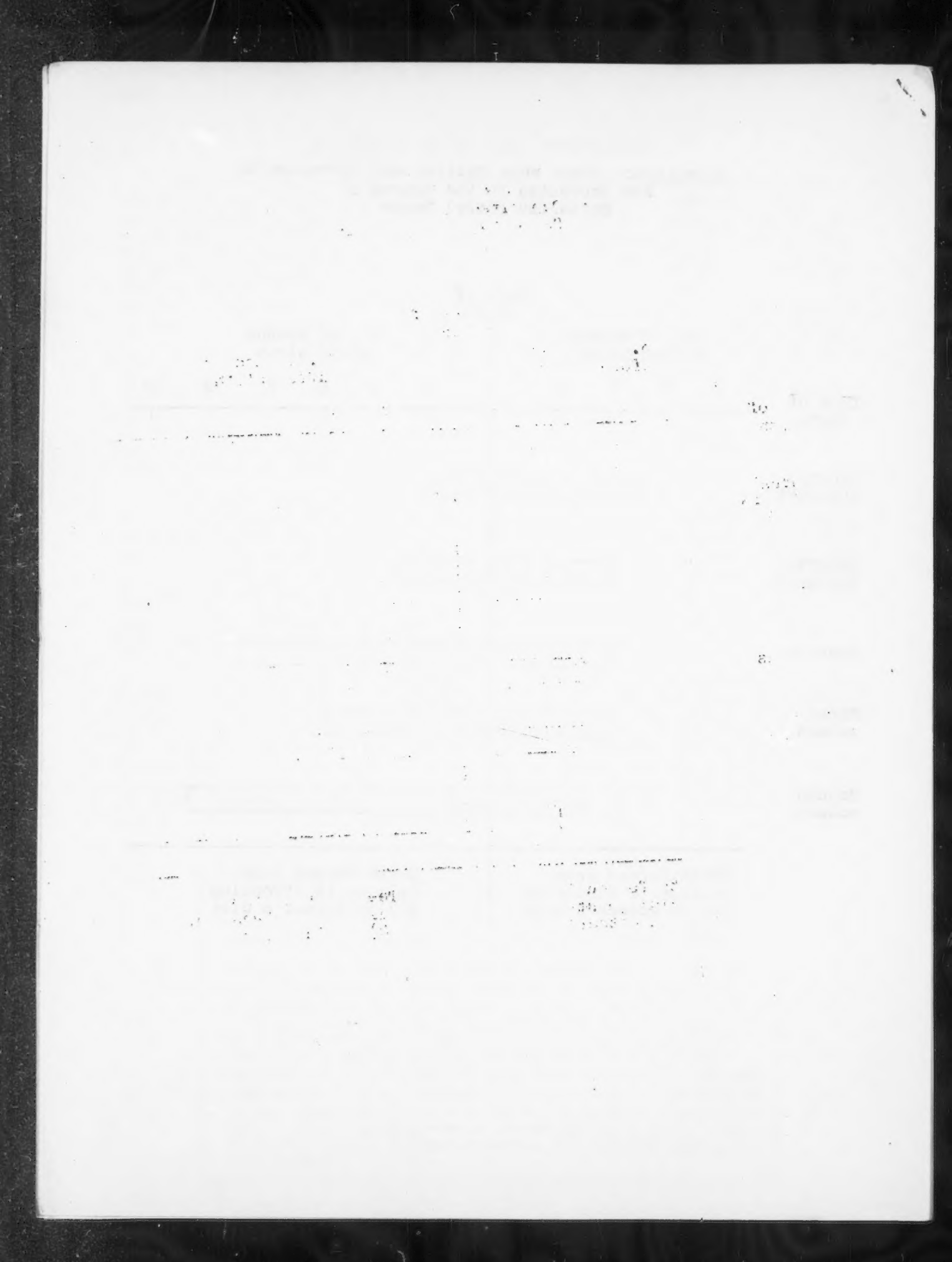
The present rate of deposition of strontium 90 in infant bones and teeth will not be revealed until 5 to 10 years from now when the baby teeth will become available from the children who are now in infancy or in the last stages of pre-natal development. Milk in the St. Louis are is presently being analyzed for strontium 90 content by the United States Public Health Service on a monthly basis, and this program is expected to continue. It will be possible to compare the current resul of milk analyses with the strontium 90 content of the teeth delivered for analysis 5 to 10 years from now.

INFORMATION from the Greater St. Louis Citizens' Committee for Nuclear Information is published 10 times a year. This issue was compiled by members of the Baby Tooth Survey subcommittee.

Officers of CNI: Dean Alexander S. Langsdorf, President; Dr. Alfred S. Schwartz, Vice-President and Treasurer; Miss Marcelle Malamas, Secrerary.

The Committee for Nuclear Information was organized last April by a community-wide group of interested citizens for the purpose of collecting and distributing to the public factual information about the effects of nuclear war, nuclear testing and non-military uses of nuclear energy. The group has 500 members at present and is supported as a non-profit organization by voluntary contributions from its members and others. The Committee's activities include: publication of the bulletin INFORMATION, which reports new developments on nuclear problems in non-technical language; a speakers' bureau, which has sent 20 scientists as speakers to about 50 speaking engagements during the past few months; Committee-sponsored public lectures on radiation problems, and scientific seminars on these subjects.

Approximate Times when Calcium and Strontium 90
Are Deposited in the Crowns of
Deciduous (Baby) Teeth


Date of Birth
No. of months before birth
No. of months after birth
Type of Tooth
8 6 4 2 0 2 4 6 8 10 12
Central incisors
Lateral incisors
Cuspids
First molars
Second molars
Teeth formed from calcium (& strontium 90) in mother's diet
Teeth formed from calcium (& strontium 90) in infant's diet